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Jawaharlal Nehru

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IS 8395-1 (1977): Cable Terminations for Automobile Wiring,
Part I: Blade Type Connectors (Male and Female) [TED 11:
Automotive Electrical Equipment]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

SPECIFICATION FOR CABLE TERMINATIONS FOR AUTOMOBILE WIRING

PART 1 BLADE TYPE CONNECTORS (MALE AND FEMALE)

(Second Reprint MARCH 2002)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110 002

AMENDMENT NO. 1 DECEMBER 1980
TO
IS : 8395 (Part I) - 1977 SPECIFICATION FOR
CABLE TERMINATIONS FOR AUTOMOBILE WIRING
PART I BLADE TYPE CONNECTORS (MALE AND FEMALE)

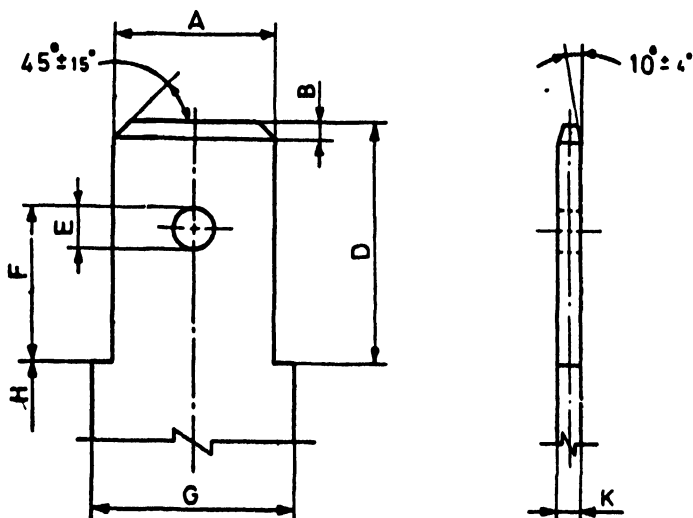
Alteration

(Page 5, Table 1) — Substitute the following for the existing table:

TABLE 1 MALE BLADE CONNECTOR

(Clauses 4.1 and 8.1)

All dimensions in millimetres.



WIDTH OF MALE TAB	A + 0 - 0.1	B ± 0.3	D ± 0.1	E (DIA) ± 0.1	F + 0 - 0.2	G Min	H Min	K ± 0.02
2.8	2.9	1.0	7.0	1.2	3.5	4.0	1.5	0.5
4.8	4.8	1.0	7.0	1.40	4.0	6.0	2.5	0.5
6.3	6.4	1.0	8.0	2.3	5.0	8.0	2.6	0.8
8	8.1	1.0	12.5	2.3	8.0	10.0	2.6	1.0
9.5	9.6	1.0	14.0	2.3	9.0	12.0	2.6	1.1

(ETDC 14)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR CABLE TERMINATIONS FOR AUTOMOBILE WIRING PART I BLADE TYPE CONNECTORS (MALE AND FEMALE)

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Indian Standard
**SPECIFICATION FOR CABLE
TERMINATIONS FOR AUTOMOBILE WIRING
PART I BLADE TYPE CONNECTORS (MALE AND FEMALE)**

0. FOREWORD

0.1 This Indian Standard (Part I) was adopted by the Indian Standards Institution on 28 June 1977, after the draft finalized by the Automobile Electrical Equipment Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard covers dimensional and performance requirements and methods of tests for blade type connectors (male and female) with insulating sleeve, used in automobile electrical wiring.

0.3 This part covers blade type connectors (male and female). Bullet and tube connectors are covered in Part II of this standard.

0.4 In preparing this standard, assistance has been derived from Doc : 48B (Secretariat) 88 'Specification for flat, quick-connect terminals' issued by International Electrotechnical Commission.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part I) prescribes the dimensions and tests for blade type connectors (both male and female) for use in automobile electrical wiring.

1.2 This specification shall apply to soldered, welded and crimped type of connectors.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Type Tests — Tests carried out to prove conformity with the specification. These are intended to prove the general qualities and design of a given type of connector.

*Rules for rounding off numerical values (revised).

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2.2 Acceptance Tests — Tests carried out on samples taken from a lot for the purpose of acceptance of the lot.

3. DESIGNATIONS

3.1 The designations of the blade type connectors shall be based on the width of the male tab and the cross-sectional area of the corresponding conductor. The connectors included in this standard are 2.8×1 , 4.8×1 , 4.8×2.5 , 6.3×1 , 6.3×2.5 , 6.3×6 , 8×2.5 , 8×6 and 9.5×6 .

4. CLASSIFICATION

4.1 The blade type connectors shall consist of two parts, namely (a) male part (*see* Tables 1, 2 and 4) and (b) female part (*see* Tables 3, 5 and 6).

5. METHOD OF CABLE FIXING

5.1 The method for fixing the cable to the female blade connector shall be one of the following:

- a) Soldering,
- b) Welding, and
- c) Crimping.

6. INSULATING SLEEVE

6.1 Insulating sleeve of suitable material and finish shall be provided for socket type of female connector as agreed to between the manufacturer and the purchaser. It should have sufficient stiffness to avoid interference while assembling the male to the female connector (*see* Table 7).

7. CURRENT RATING

7.1 The maximum continuous current rating of the blade connectors shall be as follows:

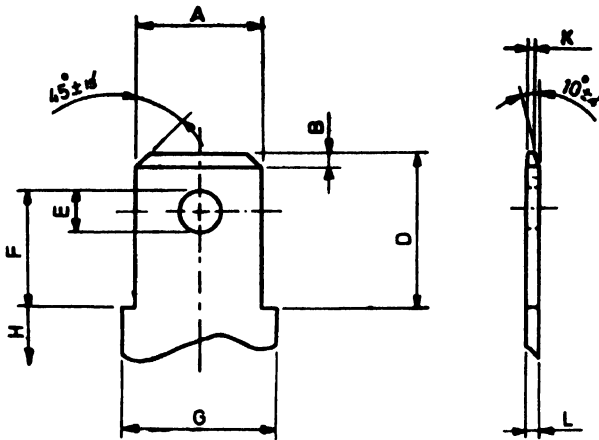
<i>Designation of Connector</i>	<i>Maximum Continuous Current Rating</i>
	A
2.8×1	3
4.8×1	6
4.8×2.5	
6.3×1	17.5
6.3×2.5	
6.3×6	
8×2.5	25
8×6	
9.5×6	35

8. DIMENSIONS

8.1 The dimensions of the blade connectors shall be as given in Tables 1 to 7.

TABLE 1 MALE BLADE CONNECTOR*(Clauses 4.1 and 8.1)*

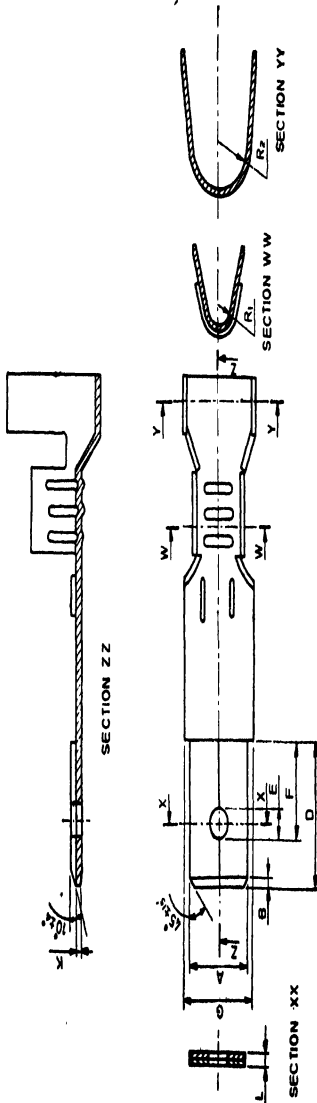
All dimensions in millimetres.



WIDTH OF MALE TAB	A +0 -0.1	B ±0.3	D ±0.1	E (Dia) ±0.1	F +0 -0.2	G Min	H Min	K ±0.05	L ±0.02
2.8	2.9	1.0	7.0	1.2	3.5	4.0	1.5	0.2	0.5
4.8	4.8	1.0	7.0	1.40	4.0	6.0	2.5	0.2	0.5
6.3	6.4	1.0	8.0	2.3	5.0	8.0	2.6	0.4	0.8
8	8.1	1.0	12.5	2.3	8.0	10.0	2.6	0.6	1.0
9.5	9.6	1.0	14.0	2.3	9.0	12.0	2.6	0.8	1.1

TABLE 2 MALE BLADE CONNECTOR (LOCKING TYPE)
(Classes 4.1 and 8.1)

All dimensions in millimetres.



Designations of Connectors	A +0 -0.1	B ±0.3	D ±0.1	E (D ₂) ±0.1	F +0 -0.2	G Min	K ±0.05	L ±0.02	FOR FLEXIBLE INSULATED CONDUCTORS	
									Nominal Cross Section mm ²	Diameter Over Insulation mm
2.8 × 1	2.9	1.0	7.0	1.2	3.5	4.0	0.2	0.5	0.65 to 1.0	2.55 to 2.75
4.8 × 1	4.8	1.0	7.0	1.4	4.0	6.0	0.2	0.5	0.65 to 1.0	2.55 to 2.75
4.8 × 2.5	4.8	1.0	7.0	1.4	4.0	6.0	0.2	0.5	1.5 to 2.5	3.05 to 3.45
6.3 × 1	6.4	1.0	8.0	2.3	5.0	8.0	0.4	0.8	0.65 to 1.0	2.55 to 2.75
6.3 × 2.5	6.4	1.0	8.0	2.3	5.0	8.0	0.4	0.8	1.5 to 2.5	3.05 to 3.45
6.3 × 6	6.4	1.0	8.0	2.3	5.0	8.0	0.4	0.8	4.0 to 6.0	4.85 to 5.65
8 × 2.5	8.1	1.0	12.5	2.3	8.0	10.0	0.6	1.0	1.5 to 2.5	3.05 to 3.45
8 × 6	8.1	1.0	12.5	2.3	8.0	10.0	0.6	1.0	4.0 to 6.0	4.85 to 5.65
9.5 × 6	9.6	1.0	14.0	2.3	9.0	12.0	0.8	1.1	4.0 to 6.0	4.85 to 5.65

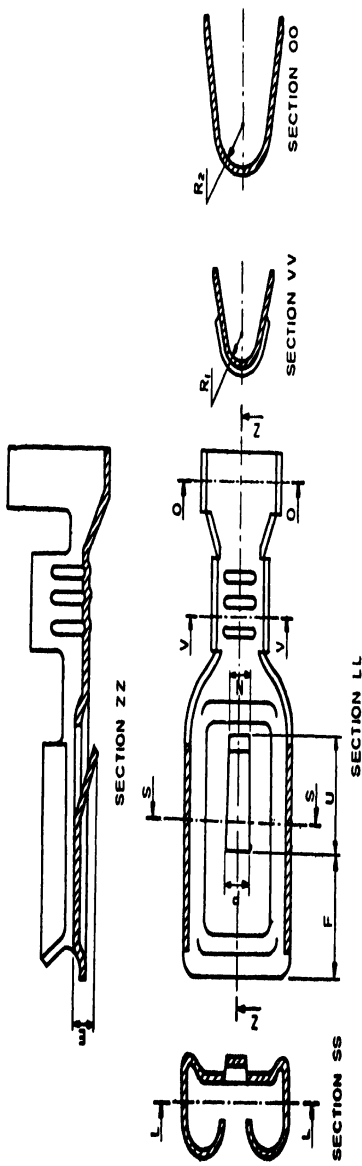
NOTE 1 — Radius dimensions R_1 and R_2 are to be agreed to between the manufacturer and the purchaser.

NOTE 2 — A small projection of 0.5 M_{max} is to be provided on either side of the connector.

NOTE 3 — Other dimensions are common with socket type male blade connector specified in Table 4.

TABLE 3 FEMALE BLADE CONNECTOR (SOCKET TYPE)
(Clauses 4.1 and 8.1)

All dimensions in millimetres.



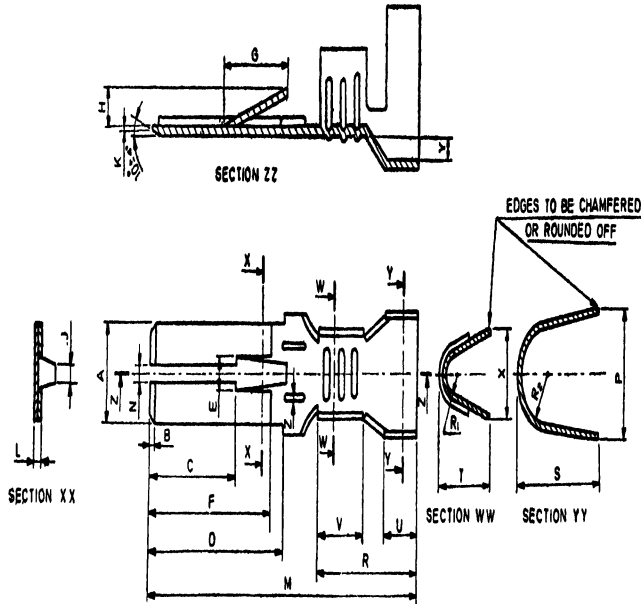
DESIGNATIONS OF CONNECTORS	E ±0.1	F ±0.1	N ±0.1	P ±0.1	U ±0.1	FOR FLEXIBLE INSULATED CONDUCTORS		
						Nominal Cross Sectional Area, mm ²	Diameter Over Insulation mm	
2.8 × 1	1.1	3.6	1.0	1.2	3.0	0.65 to 1.0	2.55 to 2.75	
4.8 × 1	1.3	3.6	1.3	1.6	3.8	0.65 to 1.0	2.55 to 2.75	
4.8 × 2.5	1.3	3.6	1.3	1.6	3.8	1.5 to 2.5	3.05 to 3.45	
6.3 × 1	1.3	2.5	1.9	2.3	4.8	0.65 to 1.0	2.55 to 2.75	
6.3 × 2.5	1.3	2.5	1.9	2.3	4.8	1.5 to 2.5	3.05 to 3.45	
6.3 × 6	1.3	2.5	1.9	2.3	4.8	4.0 to 6.0	4.85 to 5.65	
8 × 2.5	1.6	2.8	2.5	3.0	6.0	1.5 to 2.5	3.05 to 3.45	
8 × 6	1.6	2.8	2.5	3.0	6.0	4.0 to 6.0	4.85 to 5.65	
9.5 × 6	1.6	2.8	2.5	3.0	7.6	4.0 to 6.0	4.85 to 5.65	

NOTE 1 — Radius dimensions R_1 and R_2 are to be agreed to between the manufacturer and the purchaser.
NOTE 2 — A small projection of 0.5 Max is to be provided on either side of the connector.
NOTE 3 — Other dimensions are common with locking type female blade connector specified in Table 5.

TABLE 4 MALE BLADE CONNECTOR (SOCKET TYPE)

(Clauses 4.1 and 8.1)

All dimensions in millimetres.



Designations of Connectors	A	B	C	D	E	F	G	H	J	K	L	M	N	P	S	T	X	Y	Z	For Flexible Insulated Connectors		U	V	R
	$\begin{smallmatrix} +0 \\ -0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.3 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.05 \\ \pm 0.05 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.05 \\ \pm 0.05 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.02 \\ \pm 0.02 \end{smallmatrix}$	$\begin{smallmatrix} \pm 1.0 \\ \pm 1.0 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.5 \\ \pm 0.5 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.5 \\ \pm 0.5 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.5 \\ \pm 0.5 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.5 \\ \pm 0.5 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	$\begin{smallmatrix} \pm 0.1 \\ \pm 0.1 \end{smallmatrix}$	Nominal Cross Section, mm ²		Diameter Over Insulation mm		
2.8x1	2.9	1.0	7.0	15.0	1.5	13.5	3.0	2.0	1.0	0.2	0.5	27.0	0.3	3.8	3.5	2.6	2.5	0.5	0.6	0.65 to 1.0	2.55 to 2.75	1.5	2.5 \pm 0.1	5.0
4.8x1	4.8	1.0	8.5	16.0	1.8	14.0	3.5	2.5	1.25	0.2	0.5	28.0	0.4	4.5	4.5	3.0	3	0.5	0.8	0.65 to 1.0	2.55 to 2.75	2.0	3.0 \pm 0.1	6.0
4.8x2.5	4.8	1.0	8.5	16.0	1.8	14.0	3.5	2.5	1.25	0.2	0.5	28.0	0.4	5.2	5.2	4.0	3.8	0.5	0.8	1.5 to 2.5	3.05 to 3.45	2.0	3.0 \pm 0.1	6.0
6.3x1	6.4	1.0	10.5	17.2	2.5	14.8	4.5	3.0	1.45	0.4	0.8	30.0	0.5	4.5	4.5	3.0	3	0.5	1.0	0.65 to 1.0	2.55 to 2.75	2.0	3.5 \pm 0.1	7.0
6.3x2.5	6.4	1.0	10.5	17.2	2.5	14.8	4.5	3.0	1.45	0.4	0.8	30.0	0.5	5.5	5.5	4.0	3.8	0.5	1.0	1.5 to 2.5	3.05 to 3.45	2.0	3.5 \pm 0.1	7.0
6.3x6	6.4	1.0	10.5	17.2	2.5	14.8	4.5	3.0	1.45	0.4	0.8	32.0	0.5	6.0	6.4	5.6	5.4	0.5	1.0	4.0 to 6.0	4.85 to 5.65	2.5	4.0 \pm 0.2	8.0
8x2.5	8.1	1.0	12.5	18.5	3.2	16.0	6.0	3.5	1.75	0.6	1.0	32.0	0.7	5.5	5.5	4.0	3.8	0.5	1.2	1.5 to 2.5	3.05 to 3.45	2.5	4.0 \pm 0.2	8.0
8x6	8.1	1.0	12.5	18.5	3.2	16.0	6.0	3.5	1.75	0.6	1.0	32.0	0.7	6.0	6.4	5.6	5.4	0.5	1.2	4.0 to 6.0	4.85 to 5.65	2.5	4.0 \pm 0.2	8.0
9.5x6	9.6	1.0	15.0	20.0	3.2	17.0	7.5	4.0	2.0	0.8	1.1	35.0	1.0	6.0	6.4	5.6	5.4	0.5	1.5	4.0 to 6.0	4.85 to 5.65	2.5	4.0 \pm 0.2	8.0

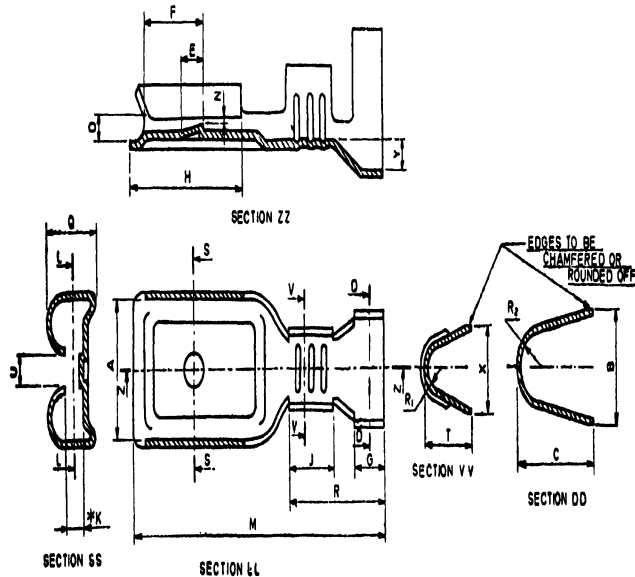
NOTE 1 — Radius dimensions R_1 and R_2 are to be agreed to between the manufacturer and the purchaser.

NOTE 2 — A small projection of 0.5 mm is to be provided on either side of the connector.

TABLE 5 FEMALE BLADE CONNECTOR (LOCKING TYPE)

(Clauses 4.1 and 8.1)

All dimensions in millimetres.



Designations of Connectors	A	B	C	D (Dia)	E (Dia)	F	G	H	J	K*	M	N	Q	R	T	X	Y	THICK- NESS	FOR FLEXIBLE INSULATED CONDUCTORS		U Min
	+0.2 -0	±0.5	±0.5	±0.1	±0.1	±0.1	±0.1	±0.1			±1.0	±0.05	±0.1	±0.2	±0.5	±0.5	±0.1	±0.05	Nominal Cross Section, mm ²	Diameter Over Insulation mm	
2.8×1	3.0	3.8	3.5	1.0	1.0	3.0	1.5	6.0	2.5±0.1	0.3 ±0.05	15.0	0.05	2.2	5.0	2.6	2.5	0.5	0.25	0.65 to 1.0	2.55 to 2.75	0.3
4.8×1	5.0	4.5	4.5	1.0	1.0	3.5	2.0	7.0	3.0±0.1	0.35±0.05	17.0	0.1	2.4	6.0	3.0	3.0	0.5	0.3	0.65 to 1.0	2.55 to 2.75	1.0
4.8×2.5	5.0	5.2	5.2	1.0	1.0	3.5	2.0	7.0	3.0±0.1	0.35±0.05	17.0	0.1	2.4	6.0	4.0	3.8	0.5	0.3	1.5 to 2.5	3.05 to 3.45	1.0
6.3×1	6.5	4.5	4.5	1.4	1.4	4.5	2.0	8.0	3.5±0.1	0.55±0.11	18.0	0.1	2.8	7.0	3.0	3.0	0.5	0.4	0.65 to 1.0	2.55 to 2.75	1.5
6.3×2.5	6.5	5.5	5.5	1.4	1.4	4.5	2.0	8.0	3.5±0.1	0.55±0.1	18.0	0.1	2.8	7.0	4.0	3.8	0.5	0.4	1.5 to 2.5	3.05 to 3.45	1.5
6.3×6	6.5	6.0	6.4	1.4	1.4	4.5	2.5	8.0	4.0±0.2	0.55±0.1	21.0	0.1	2.8	8.0	5.6	5.4	0.5	0.4	4.0 to 6.0	4.85 to 5.65	1.5
8×2.5	8.3	5.5	5.5	1.4	1.4	7.2	2.5	10.0	4.0±0.2	0.8±0.1	21.0	0.15	3.6	8.0	4.0	3.8	0.5	0.5	1.5 to 2.5	3.05 to 3.45	2.0
8×6	8.3	6.0	6.4	1.4	1.4	7.2	2.5	10.0	4.0±0.2	0.8±0.1	21.0	0.15	3.6	8.0	5.6	5.4	0.5	0.5	4.0 to 6.0	4.85 to 5.65	2.0
9.5×6	9.8	6.0	6.4	1.4	1.4	8.2	2.5	12.0	4.0±0.2	0.9±0.1	25.0	0.2	4.4	8.0	5.6	5.4	0.5	0.5	4.0 to 6.0	4.85 to 5.65	2.4

Note 1—Radius dimensions R_1 & R_2 are to be agreed to between the manufacturer and the purchaser.

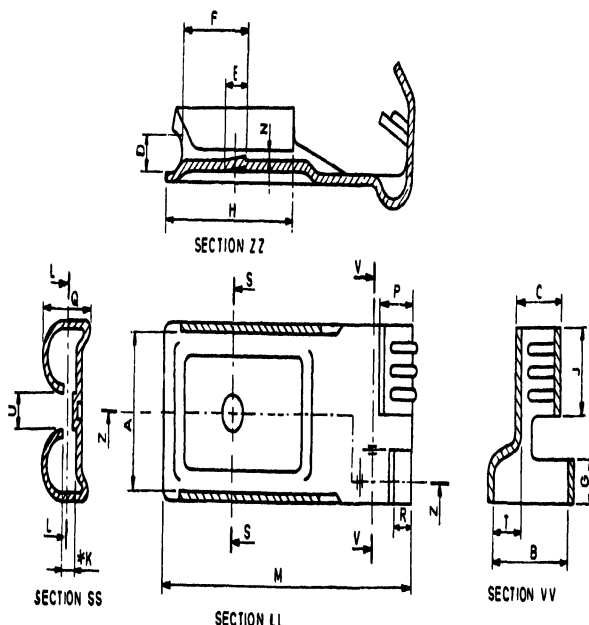
Note 2—A small projection of 0.5 Max is to be provided on either side of the connector.

*Accuracy of this dimension determines electrical contact. This dimension applies to both curl overs.

TABLE 6 FEMALE BLADE CONNECTOR (RIGHT ANGLE CABLE ENTRY)

(Clauses 4.1 and 8.1)

All dimensions in millimetres.



DESIGNATIONS OF CONNECTORS	A	B	C	D	E	F	G	H	J	K*	M	N	P	Q	R	T	THICK- NESS	FOR FLEXIBLE INSULATED CONDUCTORS		U Min
	± 0.1 -0	± 0.5	± 0.5	(Dia) ± 0.1	(Dia) ± 0.1	± 0.1	± 0.1	± 0.1	± 0.1		± 1.0	± 0.05	± 0.1	± 0.1	± 0.1	± 0.1	± 0.05	Nominal Cross Section, mm ²	Diameter Over Insulation mm	
2.8x1	3.0	4.0	2.5	1.1	1.0	3.0	1.5	5.0	2.5	0.3 ± 0.05	10.0	0.05	2.0	2.2	2.0	0.75	0.25	0.65 to 1.0	2.55 to 2.75	0.9
4.8x1	5.0	4.5	3.0	1.1	1.0	3.5	2.0	7.0	2.8	0.35 ± 0.05	12.0	0.1	3.0	2.4	2.0	0.75	0.3	0.65 to 1.0	2.55 to 2.75	1.0
4.8x2.5	5.0	5.2	3.8	1.1	1.0	3.5	2.0	7.0	2.8	0.35 ± 0.05	12.0	0.1	3.0	2.4	2.0	0.75	0.3	1.5 to 2.5	3.05 to 3.45	1.0
6.3x1	6.6	4.8	3.0	1.4	1.4	4.5	2.5	8.0	3.7	0.55 ± 0.1	15.0	0.1	3.0	2.8	2.0	0.75	0.4	0.65 to 1.0	2.55 to 2.75	1.5
6.3x2.5	6.6	5.5	3.8	1.4	1.4	4.5	2.5	8.0	3.7	0.55 ± 0.1	15.0	0.1	3.0	2.8	2.0	0.75	0.4	1.5 to 2.5	3.05 to 3.45	1.5
6.3x6	6.6	7.0	5.4	1.4	1.4	4.5	2.5	8.0	3.7	0.55 ± 0.1	15.0	0.1	3.0	2.8	2.0	0.75	0.4	4.0 to 6.0	4.85 to 5.65	1.5
8 x 2.5	8.9	6.0	3.8	1.4	1.4	7.2	3.0	10.0	4.0	0.8 ± 0.1	18.0	0.15	3.0	3.6	2.0	0.75	0.5	1.5 to 2.5	3.05 to 3.45	2.0
8 x 6	8.9	7.0	5.4	1.4	1.4	7.2	3.0	10.0	4.0	0.8 ± 0.1	18.0	0.15	3.0	3.6	2.0	0.75	0.5	4.0 to 6.0	4.85 to 5.65	2.0
9.5x6	9.8	7.0	5.4	1.4	1.4	8.2	3.0	12.0	4.8	0.9 ± 0.1	20.0	0.2	3.0	4.4	2.0	0.75	0.5	4.0 to 6.0	4.85 to 5.65	2.4

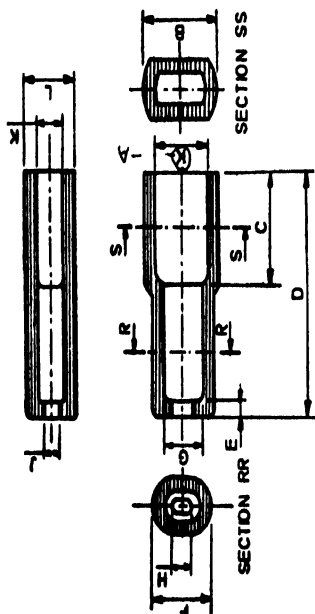
NOTE — A small projection of 0.5 Max is to be provided on either side of the connector.

*Accuracy of this dimension determines electrical contact. This dimension applies to both curl overs.

TABLE 7 INSULATING SLEEVE

(Clause 8.1)

All dimensions in millimetres.



DESIGNATIONS OF CONNECTORS	A ±0.1	B ±0.1	C ±0.5	D ±0.5	E ±0.1	F ±0.1	G ±0.1	H ±0.1	J ±0.1	K ±0.1	L ±0.1	FOR FLEXIBLE INSULATED CONDUCTORS	
												Nominal Cross Section mm ²	Diameter Over Insulation mm
2.8 × 1	3.2	4.8	9.5	15.0	0.8	3.6	2.0	2.0	1.0	1.5	3.1	0.65 to 1.0	2.55 to 2.75
4.8 × 1	5.2	7.2	9.5	20.0	1.0	6.0	4.0	2.0	2.0	2.6	4.6	0.65 to 1.0	2.55 to 2.75
4.8 × 2.5	5.2	7.2	9.5	20.0	1.0	6.0	4.0	2.3	2.0	2.6	4.6	1.5 to 2.5	3.05 to 3.45
6.3 × 1	7.0	9.0	11.0	22.0	1.0	7.0	5.0	2.0	2.0	3.5	5.5	0.65 to 1.0	2.55 to 2.75
6.3 × 2.5	7.0	9.0	11.0	22.0	1.0	7.0	5.0	2.3	2.0	3.5	5.5	1.5 to 2.5	3.05 to 3.45
6.3 × 6	7.0	9.0	11.0	22.0	1.0	7.0	5.0	2.3	2.0	3.5	5.5	4.0 to 6.0	4.85 to 5.65
8 × 2.5	9.0	11.5	16.0	28.0	1.2	10.0	7.5	2.6	2.5	5.5	8.0	1.5 to 2.5	3.05 to 3.45
8 × 6	9.0	11.5	16.0	28.0	1.2	10.0	7.5	4.0	3.0	5.5	8.0	4.0 to 6.0	4.85 to 5.65
9.5 × 6	10.5	13.0	18.0	32.0	1.2	10.0	7.5	4.0	4.0	5.5	8.0	4.0 to 6.0	4.85 to 5.65

NOTE — A small projection of 0.5 Max is to be provided on either side of the connector.

9. MATERIAL AND FINISH

9.1 The material of the connectors shall be either of alloy CuZn30 or alloy CuZn37 having temper of $\frac{1}{2}$ H and H respectively conforming to IS : 410-1967*.

9.2 The finished connectors shall be free from burrs, sharp corners, corrosion or any foreign matter.

10. MARKING

10.1 The following information shall be marked on the connectors or on the package containing the connectors:

- a) The name and/or trade-mark of the manufacturer, and
- b) Type and designation of the connector.

10.1.1 The product may also be marked with Standard mark.

10.1.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

11. TESTS

11.0 Classification of Tests

11.0.1 *Type Tests* — The following shall constitute type tests:

- a) Test for insertion-withdrawal (*see 11.2*),
- b) Test for salt spray (*see 11.3*),
- c) Test for crimp strength (*see 11.4*), and
- d) mV drop test (*see 11.5*).

11.0.2 *Criteria for Approval* — Thirty samples shall be submitted for type tests together with the relevant data. The testing authority shall issue a type approval certificate if the blade connectors are found to comply with the requirements of tests given in 11.0.1.

11.0.3 The samples shall be subjected to the tests in the following manner:

Test for insertion-withdrawal	10 samples
Test for salt spray	5 samples
Test for crimp strength	5 samples
mV drop test	10 samples

*Specification for rolled brass plate, sheet, strip and foil (*second revision*).

11.0.4 In case of any failure for one or more type tests the testing authority may call for fresh samples not exceeding twice the number of original samples and subject them to the test(s) in which failure occurred. If, in repeated test(s) no failure occurs, the test may be considered to have been satisfied.

11.0.5 Acceptance Tests — The acceptance tests shall constitute:

- a) Dimensional check up (*see* 11.1), and
- b) Test for insertion-withdrawal (*see* 11.2).

Note — The number of samples for acceptance tests shall be as agreed to between the purchaser and the manufacturer. However, a recommended plan of sampling is given in Appendix A.

11.1 Dimensional Check up — Blade connectors shall be dimensionally checked up for conformity with Tables 1 to 7.

11.2 Test for Insertion-Withdrawal

11.2.1 When a male blade connector is inserted into the end of the female blade connector without the insulating sleeve fitted, the initial insertion force of the male blade connector shall not exceed 70N.

11.2.2 After 10 reconnections, the minimum withdrawal force of the male blade connector from the female blade connector, with the insulating sleeve removed, shall be as given below:

<i>Designations of Connectors</i>	<i>Minimum Force Required to Withdraw Male Connector from Female Connector after Ten Reconnections</i>
	N
2.0 × 1	10
4.8 × 1	15
4.8 × 2.5	15
6.3 × 1	15
6.3 × 2.5	15
6.3 × 6	15
8 × 2.5	25
8 × 6	25
9.5 × 6	25

Note — For carrying out test on male connector standardized female connector should be used and *vice versa*.

11.3 Test for Salt Spray — When an assembly consisting of a male and a female blade connector without an insulating sleeve is subjected to the test given in Appendix B for two periods, each consisting of 24 hours exposure followed by one hour drying at room temperature, it shall, upon completion of this test, fulfil the mV drop test (*see* 11.5).

11.4 Test for Crimp Strength

11.4.1 New samples shall be used for each conductor size to be tested. Each connector shall be crimped to its associated conductor with a crimping tool which has been adjusted in accordance with the manufacturer's instructions.

11.4.2 The force required to separate a connector from its associated conductor shall be as given below :

<i>Nominal Cross-Sectional Area of Flexible Insulated Conductors</i>	<i>Designations of Connectors</i>	<i>Minimum Force Required to Separate the Connector from its Associated Conductor</i>
mm ²		N
0.65	2.8×1, 4.8×1, 6.3×1	89
1	2.8×1, 4.8×1, 6.3×1	125
1.5	4.8×2.5, 6.3×2.5, 8×2.5	165
2.5	4.8×2.5, 6.3×2.5, 8×2.5	254
4	6.3×6, 8×6, 9.5×6	311
6	6.3×6, 8×6, 9.5×6	374

11.5 mV Drop Test — The mV drop test shall be carried out according to the circuit diagram given in Fig. 1 and 2. The currents as given in col 2 of Table 8 shall be passed continuously through the connectors and the voltage drops shall not exceed the values given in Table 8.

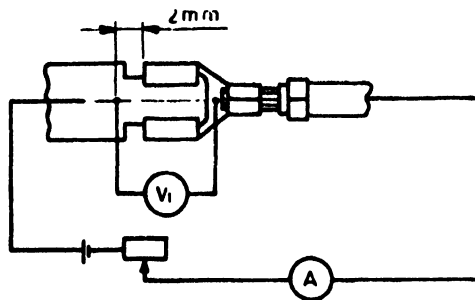


FIG. 1 CIRCUIT DIAGRAM FOR MEASURING mV DROP ACROSS DETACHABLE CONTACT

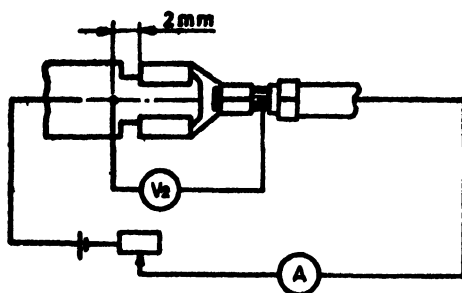


FIG. 2 CIRCUIT DIAGRAM FOR MEASURING mV DROP ACROSS CONNECTOR ASSEMBLY

TABLE 8 MILLIVOLT DROP TEST VALUES FOR BLADE TYPE CONNECTORS
(Class 11.5)

DESIGNATIONS OF CONNECTORS	TEST CURRENT	VOLTAGE DROP ACROSS DETACHABLE CONTACT V_1		VOLTAGE DROP ACROSS CONNECTOR ASSEMBLY (DETACH + CRIMP) V_2		VOLTAGE DROP ACROSS CONNECTOR ASSEMBLY (DETACH + CRIMP) AFTER SALT SPRAY TEST MILLIVOLT
		Initial Millivolt	After 10 Insertions Millivolt	Initial Millivolt	After 10 Insertions Millivolt	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	A	mV	mV	mV	mV	mV
2.8×1	2.5					
4.8×1 } 4.8×2.5 }	6					
6.3×1 } 6.3×2.5 } 6.3×6 }	10	10	15	15	20	50
8 ×2.5 } 8 ×6 }	20					
9.5×6	30					

NOTE — $V_2 - V_1$ represents voltage drop across crimped contact. It is difficult to measure this value accurately and hence V_1 and V_2 shall be measured as indicated in Fig. 1 and 2.

APPENDIX A

(Clause 11.0.5)

RECOMMENDED SAMPLING PLAN**A-0. GENERAL**

A-0.1 If statistical quality control techniques have been used for production control such test results and relevant charts may be made available along with the material supplied to enable the purchaser to judge the acceptability or otherwise of a lot. In case such information is not available, the following procedure is recommended for judging conformity of a lot with the requirements of this specification.

A-1. SCALE OF SAMPLING

A-1.1 Lot — In any consignment, all the connectors of the same size and from the same batch of manufacture shall be grouped together to constitute a lot.

A-1.2 The number of connectors to be selected from a lot shall depend upon the lot size and shall be in accordance with col 1 and 2 of Table 9.

TABLE 9 SIZE OF SAMPLE AND CRITERION FOR CONFORMITY

LOT SIZE N	SAMPLE SIZE n	PERMISSIBLE NUMBER OF DEFECTIVES
(1)	(2)	(3)
Up to 200	15	1
201 „ 300	20	1
301 „ 500	30	2
501 „ 800	40	3
801 „ 1 300	55	3
1 301 and above	75	4

NOTE — The sampling plan recommended here assures that lots with 3 percent or less defectives would be accepted most of the times and lots with defectives above 20 percent would be rejected most of the times.

A-1.3 These connectors shall be selected at random*. In order to ensure randomness, the following procedure may be adopted:

Arrange the connectors in a systematic manner and starting from any connector count them as 1, 2 . . . etc, up to r , r being equal to the integral part of N/n , N being the lot size and n the sample size. Every r th connector shall be included in the sample.

*See IS: 4905-1968 Methods for random sampling.

A-2. NUMBER OF TESTS

A-2.1 All the connectors selected under **A-1.2** shall be subjected to acceptance tests given in **11.0.5**.

A-3. CRITERION FOR CONFORMITY

A-3.1 A lot shall be considered as conforming to this specification, if the number of connectors out of those tested, failing to satisfy the requirements of any one or more of acceptance tests, does not exceed the corresponding number given in col 3 of Table 9.

APPENDIX B

(Clause 11.3)

TEST FOR SALT SPRAY

B-1. PROCEDURE

B-1.0 The ability of the cable termination with its cover and terminal compartments in position to withstand corrosion due to atmospheric conditions shall be assessed by the following test.

B-1.1 The chamber for this test shall be so constructed that the salt spray is produced in the lower part of the chamber, in the upper part of which the samples to be exposed are suspended.

B-1.2 The spray shall be produced by an atomizer employing compressed air free from all impurities.

B-1.3 The ceiling, the walls and all other parts of the chamber shall be so constructed and the samples under test so arranged that no condensate can drip on them.

B-1.4 The salt solution shall be a 5 percent solution of sodium chloride in water.

B-1.5 The cable termination shall be sprayed in such a chamber at the standard temperature 27°C, for a cycle of 50 hours consisting of two periods of 24 hours each and 1 hour draining period.

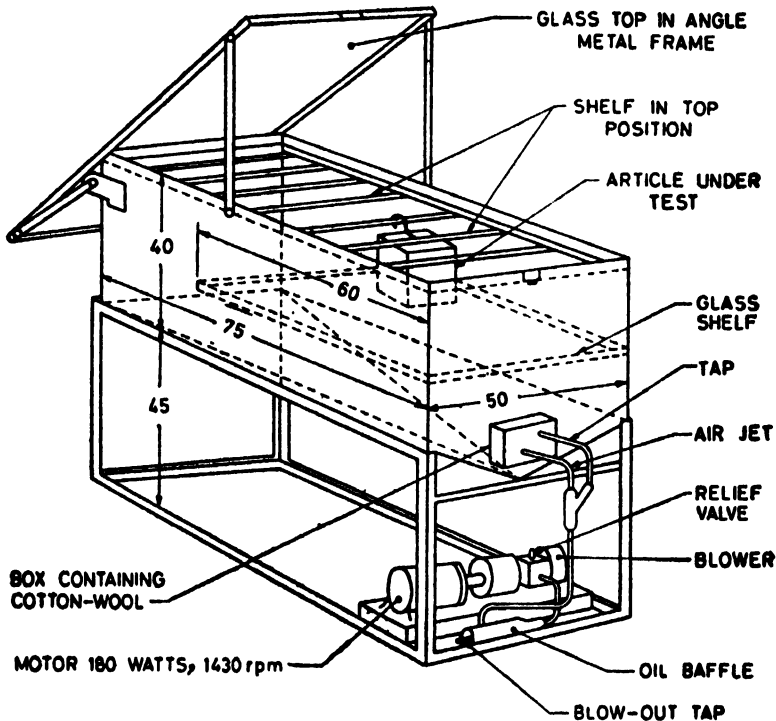
B-1.6 After removal from the salt spray chamber, the cable termination shall not show any sign of corrosion or electrolytic action which will adversely affect the functioning of any part of the device.

B-1.7 In general, a salt spray chamber described as follows would be suitable. Details of such chamber and the spraying mechanism are shown in Fig. 3 and 4 respectively.

B-1.7.1 The cabinet should approximately be of the dimensions shown, and the cabinet and its internal fittings should be made of monel metal or other suitable material. A shelf is required, which should be capable of being fitted in the upper or lower part of the cabinet.

B-1.7.2 The air used for atomizing the salt solution shall be cleaned. The pressure during the tests shall be between 20 and 35 kN/m². The pressure may be adjusted by a relief valve or by the pressure outlet of the blower.

B-1.7.3 The nozzle for atomizing the salt solution shall be adjusted for maximum amount of spray. This adjustment may be carried out by unscrewing the bottom lock nut *B* on the lower nozzle *C*, and adjusting this



All dimensions in centimetres.

FIG. 3 SALT SPRAY CHAMBER

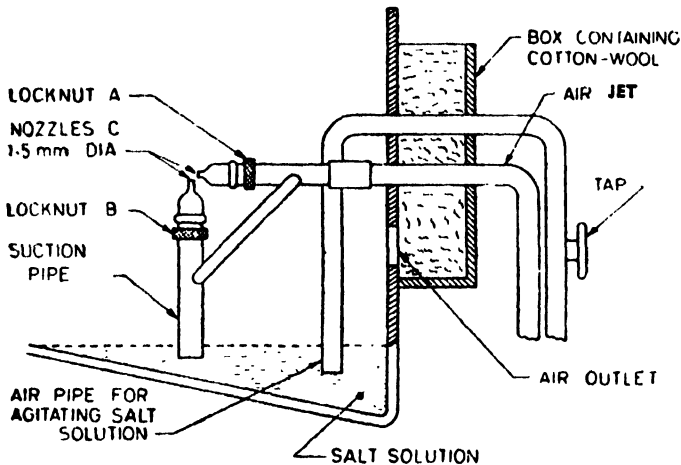


FIG. 4 DETAILS OF SPRAYING ARRANGEMENT

nozzle into position until maximum spray occurs. The diameter of the nozzles shall be 1.5 mm. A tap and second branch in the air line is available for agitating the salt solution as required.

B-1.7.4 The spraying apparatus shall be capable of atomizing not less than 1 450 ml of salt solution per hour. The quantity of solution sprayed per cubic metre capacity of the test chamber shall be approximately 177 ml per minute.

B-1.7.5 The container filled with cotton-wool acts as a breather and provides an outlet for the air which is constantly being pumped into the chamber, the cotton-wool acting as a filter and preventing salt mist from being discharged into the atmosphere.

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